

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058

February 2000

Interface Control Document (ICD)
for the
Human Research Facility
Ultrasound System

LS-71040-2

PROJECT DOCUMENT APPROVAL SHEET

DOCUMENT NUMBER

LS-71040-2

DATE

2/23/00

**NO. OF
PAGES**

28

TITLE:

Interface Control Document (ICD)
for the
Human Research Facility
Ultrasound System

APPROVED:

EA5/E. Bauer
Technical Manager

SIGNATURE ON FILE

DATE

PREPARED BY

CHANGE APPROVALS

**CHANGE
NUMBER**

Report Number LS-71040-2

Date 1/27/00

Interface Control Document (ICD)
for the
Human Research Facility
Ultrasound System

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REVISION/CHANGE APPROVALS

Date	Revision Letter	Change Number	Prepared by	Approved by:		
				Unit Manager	SR&QA Manager	Projects Manager

DOCUMENT NUMBER LS-71040-2		DOCUMENT CHANGE/ REVISION LOG		PAGE <u> 1 </u> OF <u> 1 </u>
CHANGE/ REVISION	DATE	DESCRIPTION OF CHANGE		PAGES AFFECTED
BASIC	2/23/00	Baseline Issue		All
<p>Altered pages must be typed and distributed for insertion.</p>				

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ACRONYMS AND ABBREVIATIONS

EXPRESS	Expedite the Processing of Experiments for Space Station
HRF	Human Research Facility
ICD	Interface Control Document

1.0 SCOPE

This Interface Control Document (ICD) defines and controls the interface between the Human Research Facility (HRF) Ultrasound unit and the Space Station EXPRESS (EXpedite the PROcessing of Experiments to Space Station) Rack, the HRF Workstation, and other equipment, not necessarily identified at this time, which may need to be connected to the HRF Ultrasound unit.

The Ultrasound System interfaces to be defined and controlled include: Structural and Mechanical, Electrical, Command and Data Handling, Audio/Video, Thermal Control, Waste Gas Vent and Vacuum, and Nitrogen. No attempt has been made to define the Human Factors user interfaces or Software interfaces; that task is considered out of scope for the purposes of this document.

2.0 DOCUMENTATION

Specifications pertaining to a particular interface have been included on the respective Interface Control Drawing. Requirements for Ultrasound System interfaces flow down from the Hardware Requirements Document for the Ultrasound System of the Human Research Facility (LS-71040-1).

3.0 INTERFACES

The Interface Control Drawings are provided in the appendices: Structural and Mechanical Interfaces are in Appendix A, Electrical Interfaces are in Appendix B, Command and Data Handling Interfaces are in Appendix C, Audio/Video Interfaces are in Appendix D, Thermal Control Interfaces are in Appendix E, Waste Gas Vent and Vacuum Interfaces are in Appendix F, and Nitrogen Interfaces are in Appendix G. Table 3-1 below contains the list of interface control drawings contained within each appendix. If no drawings are contained within a particular appendix, a page marked "NOT APPLICABLE" is substituted for the drawing list.

The locations of the front panel connectors on the Ultrasound unit are shown in Figure 3-1. A block diagram showing how the Ultrasound System interfaces with other hardware is shown in Figure 3-2.

TABLE 3-1. LIST OF INTERFACE CONTROL DRAWINGS
LOCATED IN APPENDICES

Appendix x	Drawing #	Rev.	Title
A	Not Applicable		
B	SLG46115053		Ultrasound Rack Power Port To EXPRESS Rack Power Connector
C	SLG46115045		Ultrasound RS232 Serial Port To HRF RS232/422 Cable or Adapter Cable Assembly
C	SLG46115047		Ultrasound Physiological Signal Ports To Physiological Signal Device
C	SLG46115056		Ultrasound Rack Data Port To EXPRESS Rack Data Connector
C	SLG46115057		Ultrasound Auxiliary ECG Port To External ECG Device
D	SLG46115046		Ultrasound External Video I/O Port To Common Video Cable
D	SLG46115051		Ultrasound Monitor Port To Workstation Monitor
E	Not Applicable		
F	Not Applicable		
G	Not Applicable		

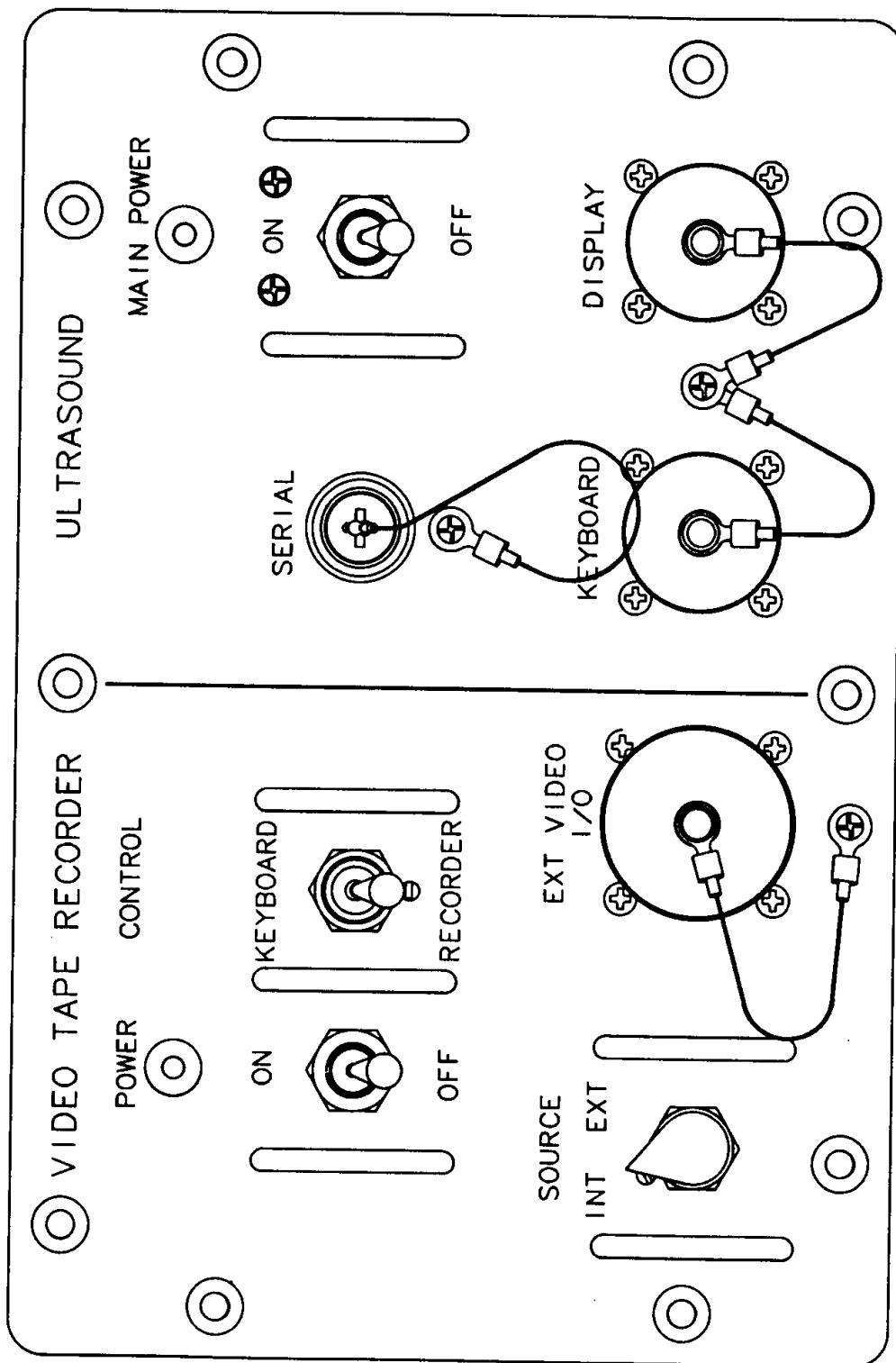


Figure 3-1. Ultrasound Front Panel Connectors

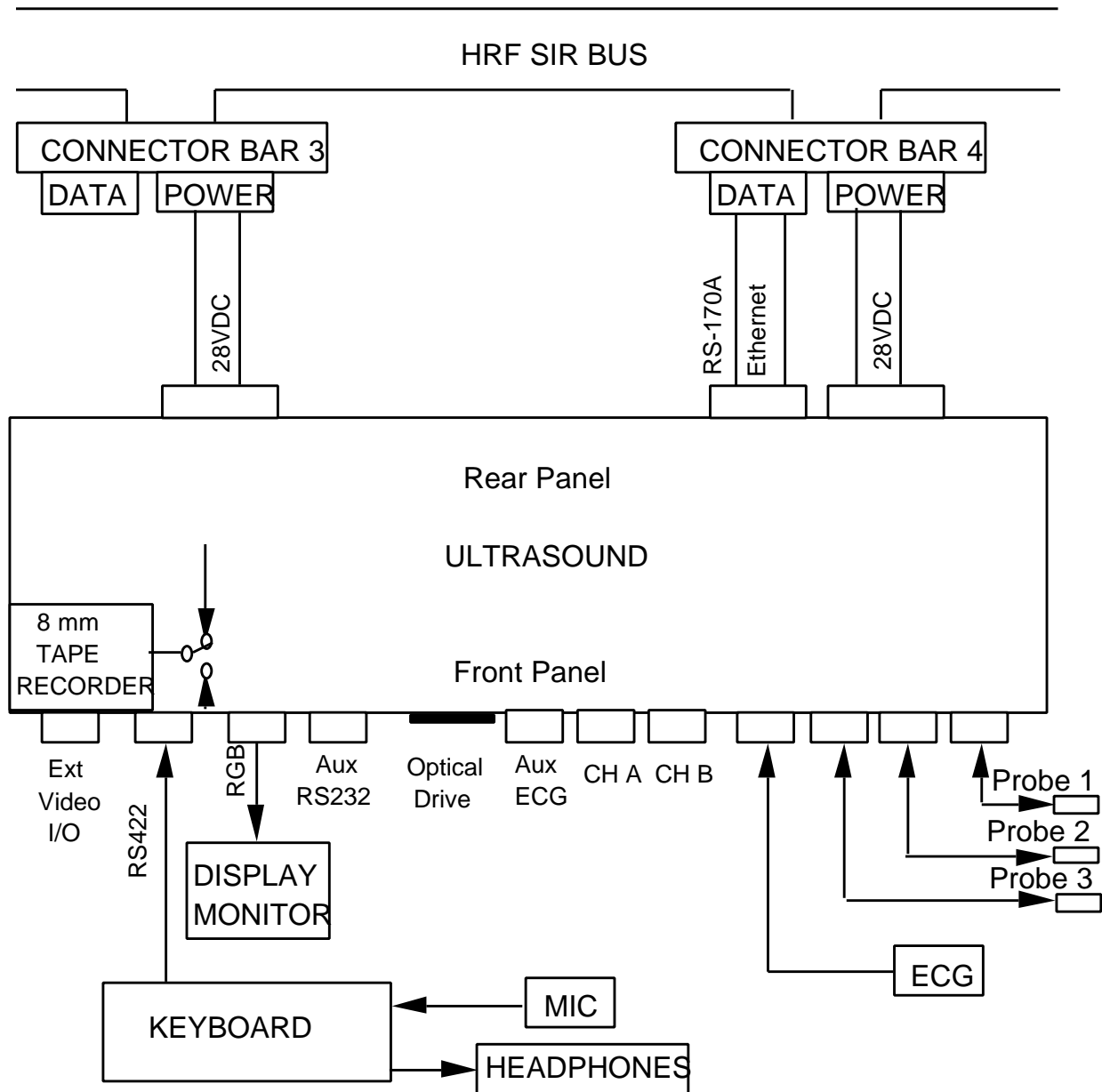


Figure 3-2. Ultrasound Interconnect Block Diagram

APPENDIX A

STRUCTURAL AND MECHANICAL INTERFACES

NOT APPLICABLE

APPENDIX B

ELECTRICAL INTERFACES

ELECTRICAL POWER INTERFACE CONTROL DRAWING					
<u>RP3 (RP4)</u> EXPERIMENT CONNECTOR NO.		<u>M83733/3RA018</u>			
<u>ERP3 (ERP4)</u> CABLE PLUG TYPE NO.		<u>M83733/2RA018</u>			
<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="border: 1px solid black; padding: 10px; width: 30%;"> <p>EXPERIMENT (NAME AND I.D. NUMBER)</p> <p><u>U/S Rack Power</u></p> <p><u>RP3 (RP4)</u></p> </div> <div style="display: flex; align-items: center; margin-left: 20px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 5px; text-align: center;">J</div> <div style="border: 1px solid black; padding: 5px; margin-right: 5px; text-align: center;">P</div> <div style="flex-grow: 1; border-bottom: 1px solid black; position: relative; margin-left: 10px;"> <div style="position: absolute; left: -10px; top: -5px; width: 10px; height: 10px; background-color: black;"></div> <div style="position: absolute; left: -10px; bottom: -5px; width: 10px; height: 10px; background-color: black;"></div> </div> </div> <div style="margin-left: 20px;"> <p>TO: EXPRESS Rack Power Connector</p> </div> </div>					
INTERFACE CONTROL DRAWING					
1. Connectors designated per D683-34513					
PROJECT ENG.	PROJECT	SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS	
				Ultrasound Rack Power Port TO EXPRESS Rack Power Connector	
				CODE IDENT NO. #21356	SIZE A
				DWG NO. SLG46115053	
				SCALE N/A	REV
				SHEET	1 OF 2

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
Primary +28 VDC	12	20	+28	1	RP3 (RP4)	1	ERP3 (ERP4)	1	
Primary 28 VDC Return	12	----	0	1	RP3 (RP4)	2	ERP3 (ERP4)	2	
Continuity	12	----	----	----	RP3 (RP4)	3	----	----	Not Connected
Continuity	12	----	----	----	RP3 (RP4)	4	----	----	Not Connected
Not used	12	----	----	----	RP3 (RP4)	5	----	----	Not Connected
Secondary +28 VDC	12	20	28	1	RP3 (RP4)	6	ERP3 (ERP4)	6	
Secondary 28 VDC Return	12	----	0	1	RP3 (RP4)	7	ERP3 (ERP4)	7	
Not used	12	----	----	----	RP3 (RP4)	8	----	----	Not Connected
Not used	12	----	----	----	RP3 (RP4)	9	----	----	Not Connected
Not used	12	----	----	----	RP3 (RP4)	10	----	----	Not Connected
Not used	12	----	----	----	RP3 (RP4)	11	----	----	Not Connected
Primary Chassis Ground	12	0	0	----	RP3 (RP4)	12	ERP3 (ERP4)	12	
Secondary Chassis Ground	12	0	0	----	RP3 (RP4)	13	ERP3 (ERP4)	13	
Not used	12	----	----	----	RP3 (RP4)	14	----	----	Not Connected
Not used	12	----	----	----	RP3 (RP4)	15	----	----	Not Connected
Not used	12	----	----	----	RP3 (RP4)	16	----	----	Not Connected
Fiber Optics	12	----	----	----	RP3 (RP4)	17	----	----	Not Connected
Fiber Optics	12	----	----	----	RP3 (RP4)	18	----	----	Not Connected
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2.						SIZE A	DWG NO.		
						REV	SLG46115053		
INTERFACE CONTROL DRAWING						SHEET		2 OF 2	

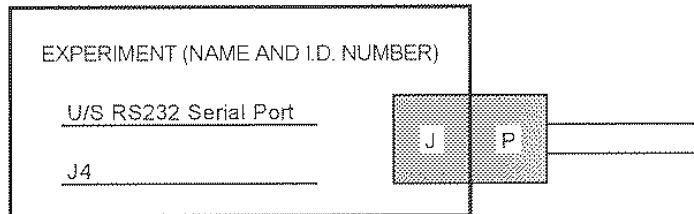
APPENDIX C

COMMAND AND DATA HANDLING INTERFACES

ELECTRICAL DATA INTERFACE CONTROL DRAWING

J4 EXPERIMENT CONNECTOR NO. DBEE1031Z012-130

P1 CABLE PLUG TYPE NO. S1031Z012-137/6.7-S



TO: RS232/422 Cable Assy.
(p/n: SEG46115685-301 or -302)
or
RS232/422/485/2CH Adapter Cable Assy.
(p/n: SEG46115594-301)

INTERFACE CONTROL DRAWING

2. RS232 specification per EIA/TIA-232-E
1. Connectors designated per HRF CHIP (see LS-71098)

PROJECT ENG.	PROJECT	SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS		
				Ultrasound RS232 Serial Port TO HRF RS232/422 Cable Assy. or Adapter Cable Assy.		
				CODE IDENT NO. #21356	SIZE A	DWNG NO. SLG46115045
				SCALE N/A	REV	SHEET 1 OF 2

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
+5VDC	0.7 mm	---	---	---	J4	1	---	---	No Connection
Vref2	0.7 mm	---	---	---	J4	2	---	---	No Connection
Serial Ground	0.7 mm		0	IV	J4	3	P1	3	Tied to Pin 9
RS422 Transmit High	0.7 mm	---	---	---	J4	4	---	---	No Connection
RS422 Transmit Low	0.7 mm	---	---	---	J4	5	---	---	No Connection
RS422/RS232 Shield	0.7 mm	0	0		J4	6	P1	6	Shield
RS422 Receive High	0.7 mm	---	---	---	J4	7	---	---	No Connection
RS422 Receive Low	0.7 mm	---	---	---	J4	8	---	---	No Connection
RS422/RS232	0.7 mm		0	IV	J4	9	P1	9	Tied to Pin 3
RS232 Receive	0.7 mm	0.1	±8	IV	J4	10	P1	10	Digital
RS232 Transmit	0.7 mm	0.1	±8	IV	J4	11	P1	11	Digital
RS232 Ground	0.7 mm	0.1	0	IV	J4	12	P1	12	Digital
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2.					INTERFACE CONTROL DRAWING		SIZE A	DWG NO. SLG46115045	
							REV	SHEET	2 OF 2

ELECTRICAL DATA INTERFACE CONTROL DRAWING

PS1 (PS2) EXPERIMENT CONNECTOR NO.

RN114BPC

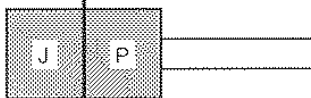
P1 CABLE PLUG TYPE NO.

M642/2-2

EXPERIMENT (NAME AND I.D. NUMBER)

Physiological Signal Ports

PS1 (PS2)



TO: Physiological Signal Device

INTERFACE CONTROL DRAWING

PROJECT ENG.	PROJECT	SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS		
				Ultrasound Physiological Trigger Ports To Physiological Signal Device		
				CODE IDENT NO. #21356	SIZE A	DWG NO. SLG46115047
				SCALE N/A	REV	SHEET 1 OF 2

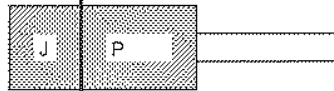
DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
Sleeve (S)	N/A	----	----	I	PS1 (PS2)	S	P1	S	Ground
Tip (T)	N/A	----	----	III	PS1 (PS2)	T	P1	T	0
Ring (R)	N/A	----	----	III (I)	PS1 (PS2)	R	P1	R	1 (Mono:Ground)
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2. INTERFACE CONTROL DRAWING						SIZE A	DWG NO. SLG46115047		
						REV	SHEET	2 OF 2	

ELECTRICAL DATA INTERFACE CONTROL DRAWING

RD4 EXPERIMENT CONNECTOR NO. M83733/3RA131
 PR1D4 RACK PLUG TYPE NO. M83733/2RA131

EXPERIMENT (NAME AND I.D. NUMBER)

U/S Rack Data Port
 RD4



TO: EXPRESS Rack Data Connector

INTERFACE CONTROL DRAWING

1. Connectors designated per D683-34513
2. Ethernet 10baseT specification per IEEE Standard 802.3/ISO 8802-3
3. Ethernet data interface protocol per D683-46319-1
4. Payload data formats per D683-43525-1

PROJECT ENG.	PROJECT	SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS		
				Ultrasound Rack Data Port TO EXPRESS Rack Data Connector		
				CODE IDENT NO. #21356	SIZE A	DWG NO. SLG46115056
				SCALE N/A	REV	SHEET 1 OF 6

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
IEEE 488 DIO1	22D	----	----	----	RD4	1	----	----	Not Connected
IEEE 488 DIO2	22D	----	----	----	RD4	2	----	----	Not Connected
Open	22D	----	----	----	RD4	3	----	----	Not Connected
Discrete 1 High	22D	----	----	I	RD4	4	----	----	Not Connected
Discrete 2 High	22D	----	----	I	RD4	5	----	----	Not Connected
Discrete 3 High	22D	----	----	I	RD4	6	----	----	Not Connected
Time Distribution	22D	----	----	----	RD4	7	----	----	Not Connected
Open	22D	----	----	----	RD4	8	----	----	Not Connected
Continuity	22D	----	----	----	RD4	9	RD4	121	Jumper
IEEE 488 DIO3	22D	----	----	----	RD4	10	----	----	Not Connected
Open	22D	----	----	----	RD4	11	----	----	Not Connected
Open	22D	----	----	----	RD4	12	----	----	Not Connected
Discrete 1 Low	22D	----	----	----	RD4	13	----	----	Not Connected
Discrete 2 Low	22D	----	----	I	RD4	14	----	----	Not Connected
Discrete 3 Low	22D	----	----	I	RD4	15	----	----	Not Connected
Time Distribution	22D	----	----	----	RD4	16	----	----	Not Connected
Open	22D	----	----	----	RD4	17	----	----	Not Connected
IEEE 488 DIO4	22D	----	----	----	RD4	18	----	----	Not Connected
IEEE 488 EIO	22D	----	----	----	RD4	19	----	----	Not Connected
Reserved	22D	----	----	----	RD4	20	----	----	Not Connected
Open	22D	----	----	----	RD4	21	----	----	Not Connected
Open	22D	----	----	----	RD4	22	----	----	Not Connected
Open	22D	----	----	----	RD4	23	----	----	Not Connected
Analog Signal 1	22D	----	----	III	RD4	24	----	----	Not Connected
Reserved	22D	----	----	----	RD4	25	----	----	Not Connected
Video 1 to Drawer High	22D	----	----	----	RD4	26	----	----	Not Connected
IEEE 488 DAV	22D	----	----	----	RD4	27	----	----	Not Connected
IEEE 488 NRFD	22D	----	----	----	RD4	28	----	----	Not Connected
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2.						SIZE A	DWG NO. SLG46115056		
INTERFACE CONTROL DRAWING						REV	SHEET 2 OF 6		

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
GSE	22D	----	----	----	RD4	29	----	----	Not Connected
GSE	22D	----	----	----	RD4	30	----	----	Not Connected
GSE	22D	----	----	----	RD4	31	----	----	Not Connected
GSE	22D	----	----	----	RD4	32	----	----	Not Connected
Discrete Shield	22D	----	----	----	RD4	33	----	----	Not Connected
Open	22D	----	----	----	RD4	34	----	----	Not Connected
Open	22D	----	----	----	RD4	35	----	----	Not Connected
Video 1 to Drawer Shield	22D	----	----	----	RD4	36	----	----	Not Connected
IEEE 488 Ground	22D	----	----	----	RD4	37	----	----	Not Connected
IEEE 488 Ground	22D	----	----	----	RD4	38	----	----	Not Connected
IEEE 488 IFC	22D	----	----	----	RD4	39	----	----	Not Connected
GSE	22D	----	----	----	RD4	40	----	----	Not Connected
GSE	22D	----	----	----	RD4	41	----	----	Not Connected
GSE	22D	----	----	----	RD4	42	----	----	Not Connected
GSE	22D	----	----	----	RD4	43	----	----	Not Connected
Analog Ground 1	22D	----	----	III	RD4	44	----	----	Not Connected
Open	22D	----	----	----	RD4	45	----	----	Not Connected
Video 1 to Drawer Low	22D	----	----	----	RD4	46	----	----	Not Connected
RS170 Video Out High	22D	----	----	II	RD4	47	PR1D4	47	Video
IEEE 488 NDAC	22D	----	----	----	RD4	48	----	----	Not Connected
IEEE 488 Ground	22D	----	----	----	RD4	49	----	----	Not Connected
Open	22D	----	----	----	RD4	50	----	----	Not Connected
PPCB 01	22D	----	----	----	RD4	51	----	----	Not Connected
GSE	22D	----	----	----	RD4	52	----	----	Not Connected
GSE	22D	----	----	----	RD4	53	----	----	Not Connected
Open	22D	----	----	----	RD4	54	----	----	Not Connected
Analog Ground 2	22D	----	----	III	RD4	55	----	----	Not Connected
Open	22D	----	----	----	RD4	56	----	----	Not Connected
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2.						SIZE	DWG NO.		
						A	SLG46115056		
INTERFACE CONTROL DRAWING						REV	SHEET 3 OF 6		

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
RS170 Video Shield	22D	----	----	----	RD4	57	PR1D4	57	Video
IEEE 488 Ground	22D	----	----	----	RD4	58	----	----	Not Connected
IEEE 488 SRQ	22D	----	----	----	RD4	59	----	----	Not Connected
IEEE 488 Shield	22D	----	----	----	RD4	60	----	----	Not Connected
PPCB 01 Low	22D	----	----	----	RD4	61	----	----	Not Connected
PPCB 02 Low	22D	----	----	----	RD4	62	----	----	Not Connected
Open	22D	----	----	----	RD4	63	----	----	Not Connected
Open	22D	----	----	----	RD4	64	----	----	Not Connected
Analog High 2	22D	----	----	III	RD4	65	----	----	Not Connected
Open	22D	----	----	----	RD4	66	----	----	Not Connected
RS422 Receive High	22D	----	----	IV	RD4	67	----	----	Not Connected
RS170 Video Out Low	22D	----	----	II	RD4	68	PR1D4	68	Video
IEEE 488 Ground	22D	----	----	----	RD4	69	----	----	Not Connected
IEEE 488 DIO5	22D	----	----	----	RD4	70	----	----	Not Connected
PPCB 01 Shield	22D	----	----	----	RD4	71	----	----	Not Connected
Open	22D	----	----	----	RD4	72	----	----	Not Connected
PPCB 02 Shield	22D	----	----	----	RD4	73	----	----	Not Connected
Open	22D	----	----	----	RD4	74	----	----	Not Connected
Analog Shield	22D	----	----	----	RD4	75	----	----	Not Connected
Open	22D	----	----	----	RD4	76	----	----	Not Connected
RS422 Receive Shield	22D	----	----	----	RD4	77	----	----	Not Connected
RS422 Transmit High	22D	----	----	IV	RD4	78	----	----	Not Connected
IEEE 488 ATN	22D	----	----	----	RD4	79	----	----	Not Connected
IEEE 488 IDIO6	22D	----	----	----	RD4	80	----	----	Not Connected
IEEE 488 DIO8	22D	----	----	----	RD4	81	----	----	Not Connected
Open	22D	----	----	----	RD4	82	----	----	Not Connected
PPCB 02 High	22D	----	----	----	RD4	83	----	----	Not Connected
Open	22D	----	----	----	RD4	84	----	----	Not Connected
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2.					SIZE	DWG NO.			
					A	SLG46115056			
INTERFACE CONTROL DRAWING					REV	SHEET 4 OF 6			

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
Open	22D	----	----	----	RD4	85	----	----	Not Connected
Open	22D	----	----	----	RD4	86	----	----	Not Connected
Open	22D	----	----	----	RD4	87	----	----	Not Connected
RS422 Receive Low	22D	----	----	IV	RD4	88	----	----	Not Connected
RS422 Transmit Shield	22D	----	----	----	RD4	89	----	----	Not Connected
IEEE 488 DIO7	22D	----	----	----	RD4	90	----	----	Not Connected
IEEE 488 REN	22D	----	----	----	RD4	91	----	----	Not Connected
PPCB 03 Shield	22D	----	----	----	RD4	92	----	----	Not Connected
PPCB 03 High	22D	----	----	----	RD4	93	----	----	Not Connected
Open	22D	----	----	----	RD4	94	----	----	Not Connected
Open	22D	----	----	----	RD4	95	----	----	Not Connected
Open	22D	----	----	----	RD4	96	----	----	Not Connected
Time Distribution	22D	----	----	----	RD4	97	----	----	Not Connected
Video 2 to Drawer High	22D	----	----	II	RD4	98	----	----	Not Connected
RS422 Transmit Low	22D	----	----	IV	RD4	99	----	----	Not Connected
IEEE 488 Ground	22D	----	----	----	RD4	100	----	----	Not Connected
IEEE 488 Ground	22D	----	----	----	RD4	101	----	----	Not Connected
Open	22D	----	----	----	RD4	102	----	----	Not Connected
PPCB 03 Low	22D	----	----	----	RD4	103	----	----	Not Connected
Open	22D	----	----	----	RD4	104	----	----	Not Connected
Ethernet Transmit High	22D	????	????	IV	RD4	105	PR1D4	105	Digital
Time Distribution	22D	----	----	----	RD4	106	----	----	Not Connected
Time Distribution	22D	----	----	----	RD4	107	----	----	Not Connected
Open	22D	----	----	----	RD4	108	----	----	Not Connected
Video 2 to Drawer Shield	22D	----	----	----	RD4	109	----	----	Not Connected
RS170 Video Out 2 High	22D	----	----	----	RD4	110	----	----	Not Connected
Open	22D	----	----	----	RD4	111	----	----	Not Connected
Open	22D	----	----	----	RD4	112	----	----	Not Connected
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2. INTERFACE CONTROL DRAWING						SIZE	DWG NO.		
						A	SLG46115056		
						REV	SHEET 5 OF 6		

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
PPCB 04 High	22D	----	----	----	RD4	113	----	----	Not Connected
PPCB 04 Shield	22D	----	----	----	RD4	114	----	----	Not Connected
Open	22D	----	----	----	RD4	115	----	----	Not Connected
Ethernet Transmit Low	22D	????	????	IV	RD4	116	PR1D4	116	Digital
Time Distribution	22D	----	----	----	RD4	117	----	----	Not Connected
Ethernet Receive Shield	22D	0	0	----	RD4	118	PR1D4	118	Shield
Video 2 to Drawer Low	22D	----	----	----	RD4	119	----	----	Not Connected
RS170 Video Out 2 Shield	22D	----	----	----	RD4	120	----	----	Not Connected
Continuity	22D	----	----	----	RD4	121	RD4	9	Jumper
Open	22D	----	----	----	RD4	122	----	----	Not Connected
Open	22D	----	----	----	RD4	123	----	----	Not Connected
PPCB 04 Low	22D	----	----	----	RD4	124	----	----	Not Connected
Open	22D	----	----	----	RD4	125	----	----	Not Connected
Ethernet Transmit Shield	22D	0	0	----	RD4	126	PR1D4	126	Shield
Open	22D	----	----	----	RD4	127	----	----	Not Connected
Ethernet Receive High	22D	????	????	IV	RD4	128	PR1D4	128	Digital
Ethernet Receive Low	22D	????	????	IV	RD4	129	PR1D4	129	Digital
Open	22D	----	----	----	RD4	130	----	----	Not Connected
RS170 Video Out 2 Low	22D	----	----	----	RD4	131	----	----	Not Connected
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2.					SIZE A	DWG NO. SLG46115056			
INTERFACE CONTROL DRAWING					REV	SHEET 6 OF 6			

ELECTRICAL DATA INTERFACE CONTROL DWG

PJ3 EXPERIMENT CONNECTOR NO.

M112A

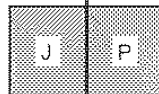
P2 CABLE PLUG TYPE NO.

M642/1-1

EXPERIMENT (NAME AND I.D. NUMBER)

Auxiliary ECG Port

PJ3



TO: External ECG Device

INTERFACE CONTROL DRAWING

PROJECT ENG.	PROJECT	SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS		
				Ultrasound Auxillary ECG Port To External ECG Device		
				CODE IDENT NO. #21356	SIZE A	DWG NO. SLG46115057
				SCALE N/A	REV	SHEET 1 OF 2

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
Sleeve (S)	N/A	---	---	---	PJ3	S	P2	S	Ground
Tip (T)	N/A	---	---	---	PJ3	T	P2	T	AUX_ECG_IN
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2. INTERFACE CONTROL DRAWING						SIZE A	DWG NO. SLG46115057		
						REV	SHEET 2 OF 2		

APPENDIX D

AUDIO/VIDEO INTERFACES

AUDIO/VIDEO INTERFACE CONTROL DRAWING

J3 EXPERIMENT CONNECTOR NO.

MS3470L18-32P

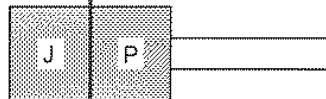
P1 CABLE PLUG TYPE NO.

MS3476L18-32S

EXPERIMENT (NAME AND I.D. NUMBER)

U/S External Video I/O

J3



TO: Common Video Cable

INTERFACE CONTROL DRAWING

1. Video stored and transmitted in HiVHS format

PROJECT ENG.	PROJECT	SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS		
				Ultrasound External Video I/O Port TO Common Video Cable		
				CODE IDENT NO. #21356	SIZE A	DWG NO. SLG46115046
				SCALE N/A	REV	SHEET 1 OF 3

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
Video (Y) In (X)	20	1	1	II	J3	A	P1	A	Audio/Video
Video (Y) In (Y)	20	1	1	II	J3	B	P1	B	Audio/Video
Video (Y) In (G)	20	1	0	II	J3	C	P1	C	Audio/Video
Not Used	20	---	---	---	J3	E	---	---	Not connected
Audio Left Out (G)	20	---	0	II	J3	D	P1	D	Audio/Video
Not Used	20	---	---	---	J3	F	---	---	Not connected
Not Used	20	---	---	---	J3	G	---	---	Not connected
Video C In (G)	20	1	0	II	J3	H	P1	H	Audio/Video
Video C In (X)	20	1	1	II	J3	J	P1	J	Audio/Video
Video C In (Y)	20	1	1	II	J3	K	P1	K	Audio/Video
Video C Out (G)	20	1	0	II	J3	L	P1	L	Audio/Video
Audio Left Out (X)	20	1	1	II	J3	M	P1	M	Audio/Video
Audio Left In (G)	20	1	0	II	J3	N	P1	N	Audio/Video
Audio Left In (X)	20	1	1	II	J3	P	P1	P	Audio/Video
Audio Left In (Y)	20	1	1	II	J3	R	P1	R	Audio/Video
Video (Y) Out (X)	20	1	1	II	J3	S	P1	S	Audio/Video
Video (Y) Out (G)	20	1	0	II	J3	T	P1	T	Audio/Video
Not Used	20	---	---	---	J3	U	---	---	Not connected
Not Used	20	---	---	---	J3	V	---	---	Not connected
Not Used	20	---	---	---	J3	W	---	---	Not connected
Not Used	20	---	---	---	J3	X	---	---	Not connected
Not Used	20	---	---	---	J3	Y	---	---	Not connected
Audio Right In (G)	20	1	0	II	J3	Z	P1	Z	Audio/Video
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2.						SIZE A	DWG NO. SLG46115046		
INTERFACE CONTROL DRAWING						REV	SHEET 2 OF 3		

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
Video C Out (X)	20			II	J3	a	P1	a	Audio/Video
Audio Right Out (G)	20		0	II	J3	b	P1	b	Audio/Video
Not Used	20	---	---	---	J3	c	---	---	Not Connected
Audio Right Out (X)	20			III	J3	d	P1	d	
Not Used	20	---	---	---	J3	e	---	---	Not Connected
Not Used	20	---	---	---	J3	f	---	---	Not Connected
Not Used	20	---	---	---	J3	g	---	---	Not Connected
Audio Right In (X)	20			II	J3	h	P1	h	Audio/Video
Audio Right In (Y)	20			II	J3	j	P1	j	Audio/Video
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2.						SIZE A	DWG NO. SLG46115046		
INTERFACE CONTROL DRAWING						REV	SHEET 3 OF 3		

AUDIOVIDEO INTERFACE CONTROL DRAWING

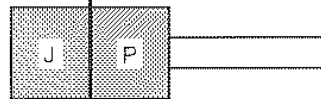
J2 EXPERIMENT CONNECTOR NO. MS27497T14F35S

P1 CABLE PLUG TYPE NO. MS27473T14F35P

EXPERIMENT (NAME AND I.D. NUMBER)

U/S Monitor Port

J2



TO: External Monitor Cable (p/n: SEG46116113-301)

INTERFACE CONTROL DRAWING

PROJECT ENG.	PROJECT	SIGNATURE	DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LYNDON B. JOHNSON SPACE CENTER HOUSTON, TEXAS		
				Ultrasound Monitor Port TO External Monitor Cable		
				CODE IDENT NO. #21356	SIZE A	DWG NO. SLG46115051
				SCALE N/A	REV	SHEET 1 OF 2

DATA									
FUNCTION	CONTACT SIZE	AMPS	VOLTS	CIRCUIT CLASS	FROM	PIN NO.	TO	PIN NO.	REMARKS
Red	22D	----	1	II	J2	1	P1	1	Audio/Video
Ground	22D	----	0	II	J2	2	P1	2	Audio/Video
Green	22D	----	1	II	J2	3	P1	3	Audio/Video
Ground	22D	----	0	II	J2	4	P1	4	Audio/Video
Blue	22D	----	1	II	J2	5	P1	5	Audio/Video
Ground	22D	----	0	II	J2	6	P1	6	Audio/Video
Horizontal Sync	22D	----	1	II	J2	7	P1	7	Audio/Video
Ground	22D	----	0	II	J2	8	P1	8	Audio/Video
Vertical Sync	22D	----	1	II	J2	9	P1	9	Audio/Video
Ground	22D	----	0	II	J2	10	P1	10	Audio/Video
VTR_+5V	22D	0.1	5	I	J2	11	P1	11	VTR FXN
END OF TAPE LED	22D	0.1	-	III	J2	12	P1	12	VTR FXN
RECORD LAMP LED	22D	0.1	-	III	J2	13	P1	13	VTR FXN
SHIELD	22D	----	-	III	J2	14	P1	14	SHIELD
THIS DWG IS USED FOR PIN ASSIGNMENTS. THIS DWG HAS NO ASSY THAT CONTAINS FRACTURE CRITICAL ELEMENTS									
(1) PER MSFC-SPEC-521, TABLE 2.						SIZE	DWG NO.		
						A	SLG46115051		
INTERFACE CONTROL DRAWING						REV	SHEET 2 OF 2		

APPENDIX E

THERMAL CONTROL INTERFACES

NOT APPLICABLE

APPENDIX F

WASTE GAS VENT AND VACUUM INTERFACES

NOT APPLICABLE

APPENDIX G

NITROGEN INTERFACES

NOT APPLICABLE

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